



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/670,877	09/27/2000	KAZUO ICHIKAWA	107469	7376
25944	7590	09/29/2005		
OLIFF & BERRIDGE, PLC P.O. BOX 19928 ALEXANDRIA, VA 22320			EXAMINER ZERVIGON, RUDY	
			ART UNIT 1763	PAPER NUMBER

DATE MAILED: 09/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 09/670,877	Applicant(s) ICHIKAWA ET AL.	
	Examiner Rudy Zervigon	Art Unit 1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 20 July 2005.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,2,5 and 6 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,5 and 6 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 September 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)     | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date. _____  | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claims 1, 2, 5, and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hara et al (U. S. Pat. 5,648,276) in view of Babayan et al (US 2002/0129902 A1) and Goodyear; Andrew L. et al. (US 5,532,190 A). Hara et al teaches a CVD system (C<sub>1</sub>, C<sub>2</sub>; Figure 2; column 7, lines 7-8) provided with a plasma generator (Fig.3, "UE", column 7, lines 15-20) having a plasma generation chamber (Fig. 3 containing "PL"; column 7, lines 15-20), including a circumferential wall (QW; Figure 3; column 7, lines 10-15) made of an insulator ("quartz"), the plasma generation chamber (Fig. 3 containing "PL"; column 7, lines 15-20) being separated from a film deposition chamber (Fig. 3 "QW" and "SW"; column 7, lines 10-15) in which a substrate (1) is arranged, and a film is deposited (column 7, lines 7-8) on the substrate within the same chamber (Fig. 3 "QW" and "SW"; column 7, lines 10-15) as the substrate is not moved (Fig.3). A material gas (Fig.3, "Gas (SiH<sub>4</sub>, etc)") is directly supplied into the film deposition chamber, radicals in the plasma are introduced into the film deposition chamber from the plasma generator through holes ("ME", mesh, Fig.3) of a lower plate (lower half of "ME"), and a thin film ("a-Si:H", column 7, lines 5-10) is deposited on the substrate. A gas feeder ("Gas (Ar, ...)"; Fig.3) is provided to the plasma generator.

Hara et al further teaches a silicon-based film is deposited on a substrate ("a-Si:H", column 7, lines 5-10, lines 65-67), then converting the silicon-based film to a crystalline silicon-based film by laser annealing (column 8, lines 5-11), then depositing a gate insulating film ("SiO<sub>2</sub>"; column

Art Unit: 1763

8, lines 20-25) on the crystalline film by a CVD system comprised of a separate film deposition chamber and plasma generation chamber as described above. Plasma "cleaning" is discussed as a step prior to forming the gate insulating film (column 13, lines 9-20). Also, see column 14, lines 10-25 and column 17, lines 1-10.

Hara does not teach that the lower plate (lower half of "ME") is connected to ground thereby allowing only radicals to pass. Further, Hara does not teach diameters of his through holes thereby allowing only radicals to pass.

Babayan teaches a capacitively coupled plasma apparatus (Figure 1). Specifically, Babayan teaches both electrically conductive upper (26, 28) and electrically conductive lower (22) electrodes as grounded ([0042]) thereby allowing only radicals to pass ([0039]).

Hara and Babayan do not teach that Hara's lower plate (lower half of "ME") include diffusion holes, separate from Hara's through holes ("ME", mesh, Fig.3).

Goodyear teaches a capacitive (electrode) plasma processing apparatus (Figure 1; column 3, line 59-column 4, line 18) including a perforated gas feeding electrode (12) which include diffusion holes (12b; Figure 1), separate from through holes (12a; Figure 1).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to replace and ground Hara's upper electrode (ME) with Goodyear's perforated gas feeding electrode as taught by Babayan and Goodyear, and to optimize the dimension of Hara's introduction hole diameters thereby allowing only radicals to pass.

Motivation to replace and ground Hara's upper electrode (ME) with Goodyear's perforated gas feeding electrode as taught by Babayan and Goodyear, and to optimize the dimension of Hara's introduction hole diameters thereby allowing only radicals to pass is to avoid ion induced

Art Unit: 1763

damage (last line, [0039]) as taught by Babayan, and for controlling regional gas compositions during processing as taught by Goodyear (column 4; lines 59-64) for uniform processing as taught by Goodyear (column 4; lines 43-50). Further, it is well established that changes in apparatus dimensions are within the level of ordinary skill in the art. (Gardner v. TEC Systems, Inc., 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984); In re Rose, 220 F.2d 459, 105 USPQ 237 (CCPA 1955); In re Rinehart, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); See MPEP 2144.04).

### *Response to Arguments*

3. Applicant's arguments filed July 20, 2005 have been fully considered but they are not persuasive.

4. Applicant states:

“

Babayan does not disclose or suggest that each of through holes of a lower plate is designed to pass radicals only to a film deposition chamber, as recited in independent claim 1, and similarly recited in independent claim 5.

“

The Examiner disagrees. The Examiner specifically cited that Babayan teaches both electrically conductive upper (26, 28) and electrically conductive lower (22) electrodes as grounded ([0042]) thereby allowing only radicals to pass ([0039]). In particular, Babayan states “In one embodiment, the invention confines the plasma to the powered and grounded electrodes, so that, for the most part, only neutral reactive species contact the substrate or work piece, thus avoiding ion bombardment and any significant ion-induced damage of the substrate or work piece.” As

Art Unit: 1763

such, Babayan teaches an apparatus that passes only “neutral reactive species” of which “radials” are a part. Further, when the structure recited in the reference is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent (In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977); MPEP 2112.01).

5. Applicant states:

“

Babayan clearly states that the members 26 and 28 are merely two perforated sheets. See paragraph (00422. Nowhere does Babayan disclose that members 26 and 28 are electrodes. Therefore, Babayan does not provide for the teaching; suggestion or motivation that members 26 and 28 are electrodes. Thus, Babayan does not disclose or suggest the claimed invention.

“

In response, the Examiner cites Babayan’s Figure 1 which clearly shows each of plates 28 and 26 are grounded, thus each of plates 28 and 26 must be conductive and are thus cathode electrodes.

### ***Conclusion***

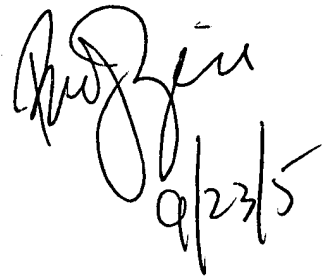
6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

Art Unit: 1763

however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (571) 272.1442. The examiner can normally be reached on a Monday through Thursday schedule from 8am through 7pm. The official fax phone number for the 1763 art unit is (703) 872-9306. Any Inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Chemical and Materials Engineering art unit receptionist at (571) 272-1700. If the examiner can not be reached please contact the examiner's supervisor, Parviz Hassanzadeh, at (571) 272-1435.



Rudy Zervigon  
9/23/5